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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
BOYD, JENNIFER A	

ART UNIT	PAPER NUMBER
1771	

DATE MAILED: 01/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/719,153	MARZOLIN ET AL.
	Examiner	Art Unit
	Jennifer A Boyd	1771

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 June 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11,13-18 and 20-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11,13-18 and 20-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Amendment

1. The Request for Continued Examination, Applicant's Amendments and Accompanying Remarks, filed June 20, 2003, have been entered and have been carefully considered. Claims 1 – 3, 13 and 15 are amended, claims 21 – 23 have been added and claims 1 – 11, 13 – 18 and 20 – 23 are pending. In view of Applicant's Amendments, the Examiner withdraws the 35 U.S.C. 112, 2nd paragraph rejection of claim 15 as set forth in paragraphs 3 and 4 of the previous Office Action dated February 20, 2003. Despite these advances, the invention as currently claimed is not found to be patentable for reasons herein below.

Claim Objections

2. Claim 4 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 4 is not further limiting. The claim states that the adhesion promoter can be organic or inorganic or organic/inorganic hybrid. It is unclear what type of material would **not** meet that limitation. It should be noted that the Applicant states in the Response dated June 20, 2003 that claim 4 has been amended to overcome the objection, however, the Response does not include an amendment to claim 4.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 22 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Gravisse et al. (US 4,211,813).

Gravisse is directed to a photoluminescent textile material (Title).

Gravisse teaches a sheet material comprising a textile and a coating consisting of one or more synthetic resins admixed with a photoluminescent complex (Abstract). Gravisse teaches that the coating can comprise zinc sulphide (Abstract). The Examiner equates the synthetic resin to Applicant's "adhesion promoter" and the zinc sulphide to Applicant's "photocatalytic semi-conducting material". Gravisse teaches that the textile can comprise a fibrous material such as a woven, knitted or non-woven fabric (column 1, lines 20 – 30).

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 1 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arakawa Tamio et al. (JP 08-252305).

As to claims 1 and 10, Arakawa teaches an air purifying sheet comprising a photocatalytic semi-conducting material, such as titanium oxide, adhered to a glass fiber fabric (Abstract). Arakawa teaches that the titanium oxide can be in anatase form (page 2, [0006]).

According to Hawley's Condensed Chemical Dictionary, "anatase" is a natural crystallized form of titanium dioxide, therefore, the limitation of being "at least partly crystallized" is met. The second embodiment of Arakawa's invention involves applying an aqueous solution containing the photocatalyst particles and polytetrafluoroethylene particles, which can act at the Applicant's "adhesion promoter", to a glass fiber fabric (Description of Prior Art, page 1, [0006]).

As to claim 1, Arakawa discloses the claimed invention except for that the photocatalytic coating material coats fibers in the portion of the fibrous material over a thickness of between 30 and 50nm. It should be noted that the amount of photocatalytic coating used over the thickness of the fibrous material is a result effective variable; as the thickness of the photocatalytic coating increases, the material has better filtering, odor-controlling or bacteria-fighting functions, since it has been held that where general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 220 F.2d 454 USPQ 233 (CCPA 1955). In the present invention, one would have been motivated to optimize the amount of photocatalytic coating used on the fibrous material to create superior filters and odor-controlling or bacteria-fighting materials.

7. Claims 1 – 9, 11 – 19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murasawa (US 5,547,823).

As to claim 1, Murasawa teaches that a fibrous material (such as a wood or paper sheet) (column 4, line 60) has particles of a photocatalyst such as titanium oxide in anatase form (claim

4 of Murasawa) adhered thereon via a less degradative adhesive such as a fluorinated polymer, which acts as the Applicant's "adhesion promoter" (Abstract).

As to claim 2, the titanium oxide is dispersed into a solvent in order to coat the substrate (column 5, lines 23 – 27), which is in any crystal form including anatase (claim 4) which in order to spray coat would have in a suspended form.

As to claim 3, the source of the titanium oxide is irrelevant to the claimed product, therefore, the claim is not patentably limiting.

As to claims 4 and 21, the adhesion promoter can be organic or inorganic (column 3, lines 19 – 26) and it can be multi-component (column 3, lines 26 – 28).

As to claim 5, the adhesion promoter can contain silicone based polymer (column 3, lines 52 – 55).

As to claim 6, the adhesion promoter can contain a fluorinated polymer (column 3, lines 38 – 52).

As to claim 7, the titanium oxide used as the photocatalyst also is used as a part of the adhesion promoter (Abstract).

As to claim 8, the adhesion promoter can contain aluminum phosphate (column 3, line 23).

As to claim 9, the adhesion promoter is one element in the adhesive composition (binder) (column 3, lines 26 – 28).

As to claim 11, the fibrous material can be in paper form (column 4, line 61).

As to claim 13, Murasawa teaches that a fibrous material (such as a wood or paper sheet) (column 4, line 60) has particles of a photocatalyst such as titanium oxide in anatase form (claim

4 of Murasawa) adhered thereon via a less degradative adhesive such as a fluorinated polymer, which acts as the Applicant's "adhesion promoter" (Abstract). The titanium oxide is dispersed into a solvent in order to coat the substrate (column 5, lines 23 – 27) which in order to spray coat would have in a suspended form. It should be noted that the fibrous material such as wood or paper sheet would inherently contain a binder to consolidate fibers into such products.

As to claims 14, 15 and 16, the coating composition is applied to the fibrous material such as a mat (column 5, lines 54 – 68), therefore is applied downstream from the fiberizing devices. After the coating or spraying, the composition is fixed by a technique of drying, irradiating with ultra-violet rays, heating cooling or using a crosslinking agent (column 6, lines 5 – 16) which would constitute the heat treatment/conditioning devices.

As to claim 17, the coating of the composition is done using any ordinary coating technique in the liquid phase, which is implied by spraying or immersing (column 5, lines 54 – 60).

As to claim 18, the fibrous material is an air purifying sheet (Abstract).

As to claims 1 and 12, Murasawa discloses the claimed invention except for that the photocatalytic coating material coats fibers in the portion of the fibrous material over a thickness of between 30 and 50nm. It should be noted that the amount of photocatalytic coating used over the thickness of the fibrous material is a result effective variable; as the thickness of the photocatalytic coating increases, the material has better filtering, odor-controlling or bacteria-fighting functions, since it has been held that where general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In*

re Aller, 220 F.2d 454 USPQ 233 (CCPA 1955). In the present invention, one would have been motivated to optimize the amount of photocatalytic coating used on the fibrous material to create superior filters and odor-controlling or bacteria-fighting materials.

8. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murasawa (US 5,547,823) in view of Oosawa (JP 08-269391).

Murasawa fails to disclose the use of an antioxidant, an ultraviolet absorber or a hindered amine light stabilizer.

Oshawa teaches a coating composition comprising an organic metallic complex, a triazine-based or oxalic acid anilide-based ultraviolet absorber and a hindered amine light stabilizer as an antioxidant (Abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the ultraviolet absorbing and antioxidant composition of Ohsawa in the fibrous material of Murasawa in order to have a material with excellent stability and weatherability without discoloration.

Response to Arguments

9. Applicant's arguments filed June 20, 2003 have been fully considered but they are not persuasive.

In response to Applicant's Argument that Arakawa Tamio et al. (JP 08-252305) and Murasawa (US 5,547,823) do not render the thickness of the photocatalytic coating material between 30 and 50 nm as obvious, the Examiner respectfully argues the contrary. Although

Arakawa and Murasawa do not specifically teach that the aqueous dispersion of photocatalyst and PTEF particles can be coated over at least a portion of the fibrous material over a thickness of between 30 and 50 nm, it would have been obvious to optimize or finding the workable ranges of the coating thickness in order to maximize the fibrous material's filtering, odor-controlling or bacteria-fighting abilities. Like the Applicant's invention, Murasawa teaches that the coating composition can be applied by dip coating, roller coating and spray coating among other methods (column 5, lines 53 – 60), therefore, it would be reasonable to assume that Murasawa could also adjust the level of coating thickness when applying the coating. The Applicant notes that neither Arakawa or Murasawa disclose or suggest that the mean crystallite size would be determinative in the effective thickness of the photocatalytic coating material. The Examiner agrees, ***however,*** the Applicant does not include this limitation in the claims. It is highly suggested to the Applicant to claim the mean crystallite size if that element is crucial to the invention. Additionally, the Applicant has not established how the crystal size relates to the thickness, instead has only stated that it does relate in some fashion.

In response to Applicant's Arguments that Arakawa Tamio et al. (JP 08-252305) and Murasawa (US 5,547,823) do not meet the limitation of new claims 22 and 23, the Examiner agrees. Please refer to the 35 U.S.C. 102(b) rejection of claims 22 and 23 as being anticipated by Gravisse et al. (US 4,211,813) as discussed above in paragraphs 3 and 4.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A Boyd whose telephone number is 571-272-1473. The examiner can normally be reached on Monday thru Friday (8:30am - 6:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on 571-272-1478. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-0994.

Jennifer Boyd
January 8, 2004

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